Studies on Ship's Bottom Paints. : Solubility of Cuprous Oxide Included in Antifouling Paints

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in turpentine oil after the following various treatments, and their color of the solutions was compared with each other colorimetrically to evaluate the effects of these treatments.

Firstly, rice-waxoil, being separated from impurities, was washed by stirring respectively with 3 or 4 volumes of 2% solutions of various inorganic and organic acids, salts, reducing agents and oxidizers. Experimental results showed that inorganic acids, such as hydrochloric-, nitric-, and sulfuric acids, reducing organic acids such as oxalic- and citric acids and salt such as sodium oxalate were effective for the decolorization of rich-waxoil, and actually decolorized samples were faded in brown and became organge-yellow or green.

Next, the samples, after the thorough washing dy dilute sulfuric acid solution, were further subjected to acid-clay treatment, oxidation, reduction etc. The results showed that oxidation with 30% hydrogen peroxide caused decolorization, and acid-clay treatment and catalytic hydrogenation had also some effects, and treatment with catalytic hydrogenation followed by hydrogen peroxide, gave a yellowish- white substance which was rendered reddish-brown by washing with iron salt solution.

From the above experimental results we conclude that the coloring of crude rice-waxoil is reduced by acid solution treatment, which means the removal of iron soaps from the oil, and greenish color coming from vegetable coloring matters is removable by acid-clay treatment, and organge or light-brown color due to the natural or secondary coloring substances of rice-waxoil is only decolorized by sevrre reduction or oxidation process.

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30. Studies on Ship's Bottom Paints.

Solubility of Cuprous Oxide Included in Antifouling Paints.

Itsuro Yamakita, Yoshio Araki and *Sadao Shimomoto.*

Antifouling effects of ship's bottom paints are thought, to large extent, to depend upon the solubility of cuprous oxide in sea water, which has been proposed as one of antifouling toxics. We tried to examine some influences upon the solubility of cuprous oxide. In our experiments, glass plates were coated with various paints, and dipped in water and 3% NaCl solution respectively. After 7 days, copper content of the water and NaCl solution were determined respectively both polarographically and colorimetrically with potassium xantogenate.

The compositions of the paints and the quantity of copper dissolved from 1 square cm. of each paint surface in 7 days were as follows.

1) Influence of Vehicles upon the Solubility of Copper.

Rosin, 20%; One of 5 Kinds of Vegeable Oils, 20%; Turpentine Oil, 20%; Cu_2O, 40%.

Vegetable oil	A. V.	micrograms of copper per 1cm² of paint surface in 7days	
		in water	in 3% NaCl solution
higher A. V. rice oil	102	0.9	0.9
distillation residue of rice oil	41	2.7	1.9
soya bean oil	3.3	8.8	6.5
linseed oil	4.1	6.8	9.4
lower A. V. rice oil	2.6	12.1	12.8

2) Influence of Added Materials upon the Solubility of Copper.

Rosin, 20% ; Higher A. V. Rice Oil, 20% ; Turpentine Oil, 20% ; Cu_2O, 35% ; One of 9 Kinds of Added Materials, 5%.

Addde material	micrograms of copper per 1cm² of paint surface in 7days	
	in water	in 3% NaCl solution
Cu_2O	0.9	0.9
$CaCO_3$	0.9	0.9
ZnO	0.9	2.5
Cu-Soap	1.2	3.5
HgO	3.9	4.4
Fe_2O_3	5.2	4.2
$BaSO_4$	4.5	4.6
$CaSO_4$	4.8	4.1
CuO	5.9	4.2

According to the above results, the higher the acid value of the oil in vehichle is, thg less the dissolved copper is. And the solubility of copper varies in wide range by adding other materials.

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31. A Knowlege on the Bart Reaction.

Risaburo Nakai and *Yutaka Yamakawa.*

The general method for the preparation of aromatic arsonic acids is the Bart reaction, which involves the inter action of a diazonium salt with an alkali arsenite. In the course of the survey of several aromatic diarsonic acids, it has been found that the effect of substituent groups on yield was significant.

Hydroxy groups. The conversion of o-and p-aminophenol to the corresponding hydroxyphenylarsonic acid takes place with the yield of 65% and 61% respectively, while the reaction fails with m-isomer.

Nitro groups. p-Nitroaniline is converted into p-nitrophenylarsonic acid with satisfactory yield of 62% and m-nitroaniline gives somewhat less yield (28%).